

TEST REPORT

Product : 7"Tablet PC
Trade mark : DragonTouch, KINGPAD, KINGSLIM, AKASO
Model/Type reference : Y88X PLUS, Y88X Pro, X7, X7 PLUS, X7 Pro, V7, V7 PLUS, V7 Pro, X70, X70 PLUS, X70 Pro, V70, V70 PLUS, V70 Pro
Serial Number : N/A
Report Number : EED32I00276401
FCC ID : S5V-D107K4
Date of Issue : Dec. 07, 2016
Test Standards : 47 CFR Part 15 Subpart C (2015)
Test result : PASS

Prepared for:

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United States

Prepared by:

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Dec. 07, 2016

Check No.: 2496597403

2 Version

Version No.	Date	Description
00	Dec. 07, 2016	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Conducted Peak Output Power	47 CFR Part 15 Subpart C Section 15.247 (b)(1)	ANSI C63.10-2013	PASS
20dB Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.247 (a)(1)	ANSI C63.10-2013	PASS
Carrier Frequencies Separation	47 CFR Part 15 Subpart C Section 15.247 (a)(1)	ANSI C63.10-2013	PASS
Hopping Channel Number	47 CFR Part 15 Subpart C Section 15.247 (b)	ANSI C63.10-2013	PASS
Dwell Time	47 CFR Part 15 Subpart C Section 15.247 (a)(1)	ANSI C63.10-2013	PASS
Pseudorandom Frequency Hopping Sequence	47 CFR Part 15 Subpart C Section 15.247(b)(4)&TCB Exclusion List (7 July 2002)	ANSI C63.10-2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
Radiated Spurious emissions	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

Remark:

Test according to ANSI C63.4-2014 & ANSI C63.10-2013.

The tested sample and the sample information are provided by the client.

Model No.: Y88X PLUS, Y88X Pro, X7, X7 PLUS, X7 Pro, V7, V7 PLUS, V7 Pro, X70, X70 PLUS, X70 Pro, V70, V70 PLUS, V70 Pro

Only the model Y88X PLUS was tested, since the PCB, Schematic, Hardware etc were identical for the above models, Y88X PLUS, Y88X Pro, X7, X7 PLUS, X7 Pro, V7, V7 PLUS, V7 Pro, X70, X70 PLUS, X70 Pro, V70, V70 PLUS, V70 Pro are named differently due to difference agent and marketing purposes.

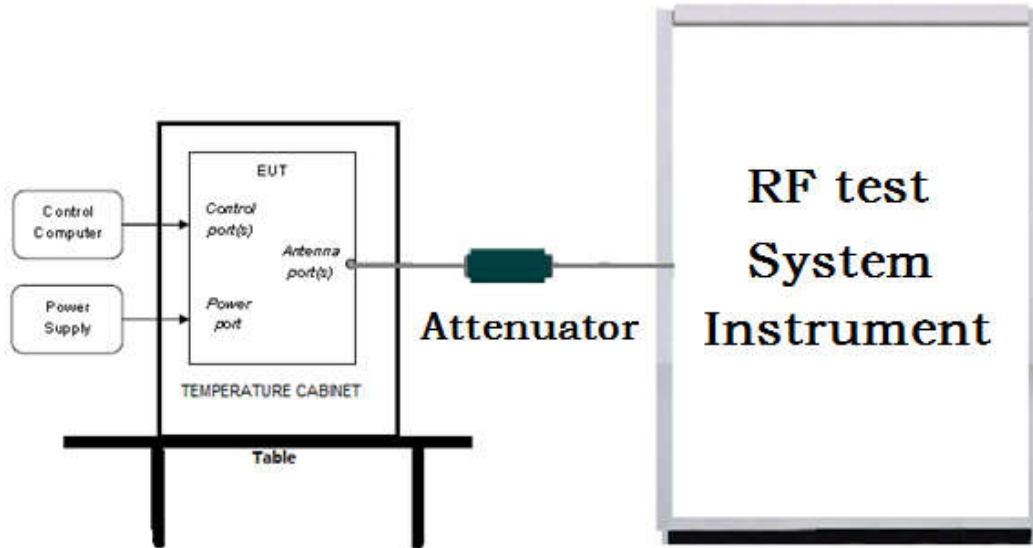
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5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

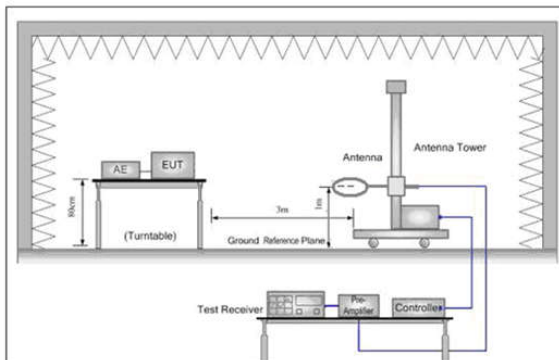


Figure 1. Below 30MHz

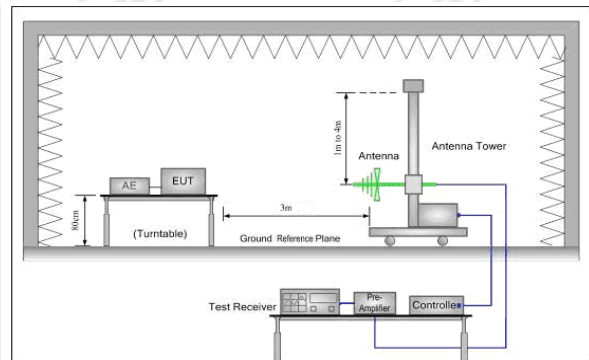


Figure 2. 30MHz to 1GHz

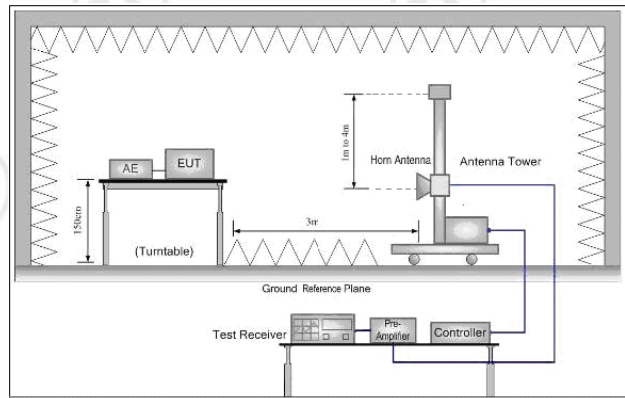
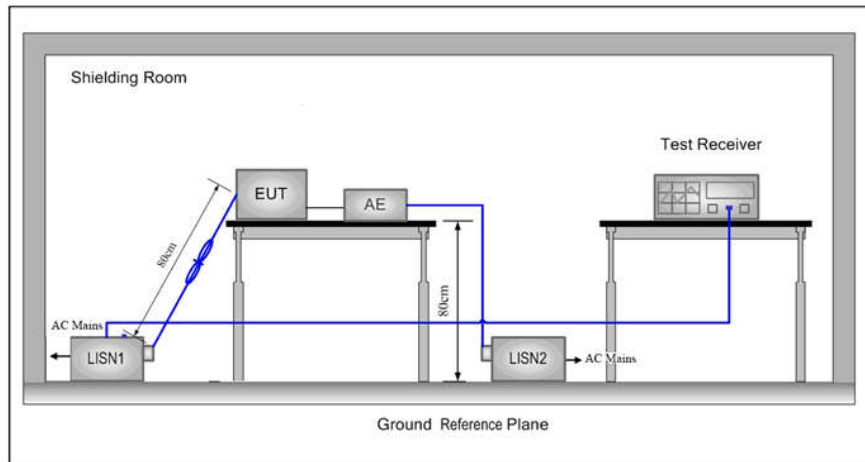


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	23 °C
Humidity:	54% RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test Mode	Tx	RF Channel		
		Low(L)	Middle(M)	High(H)
GFSK/ π /4DQPSK/ 8DPSK(DH1,DH3,DH5)	2402MHz~2480 MHz	Channel 1	Channel 40	Channel79
		2402MHz	2441MHz	2480MHz
TX mode:	The EUT transmitted the continuous modulation test signal at the specific channel(s).			

Test mode:

Pre-scan under all rate at Highest channel 79

Mode	GFSK		
packets	1-DH1	1-DH3	1-DH5
Power(dBm)	0.970	0.973	0.976

Mode	π /4DQPSK		
packets	2-DH1	2-DH3	2-DH5
Power(dBm)	2.377	2.381	2.384

Mode	8DPSK		
packets	3-DH1	3-DH3	3-DH5
Power(dBm)	2.659	2.661	2.664

Through Pre-scan, 1-DH5 packet the power is the worst case of GFSK, 2-DH5 packet the power is the worst case of π /4DQPSK, 3-DH5 packet the power is the worst case of 8DPSK.

6 General Information

6.1 Client Information

Applicant:	Proexpress Distributor LLC
Address of Applicant:	11011 Greenwood Ave N 11011 Greenwood Ave N, Seattle Washington United States
Manufacturer:	Proexpress Distributor LLC
Address of Manufacturer:	11011 Greenwood Ave N 11011 Greenwood Ave N, Seattle Washington United States
Factory:	Proexpress Distributor LLC
Address of Factory:	11011 Greenwood Ave N 11011 Greenwood Ave N, Seattle Washington United States

6.2 General Description of EUT

Product Name:	7" Tablet PC
Model No.:	Y88X PLUS, Y88X Pro, X7, X7 PLUS, X7 Pro, V7, V7 PLUS, V7 Pro, X70, X70 PLUS, X70 Pro, V70, V70 PLUS, V70 Pro
Test Model No.:	Y88X PLUS
Trade Mark:	DragonTouch, KINGPAD, KINGSLIM, AKASO
EUT Supports Radios application:	Wlan 2.4GHz 802.11b/g/n(HT20and HT40), Bluetooth V3.0+EDR
AC adapter:	Model: GS-0500200A Input: 100-240VAC 50/60Hz Output: DC5V \approx 2000mA
Sample Received Date:	Oct. 25, 2016
Sample tested Date:	Oct. 25, 2016 to Dec. 07, 2016

6.3 Product Specification subjective to this standard

Operation Frequency:	2402MHz~2480MHz						
Bluetooth Version:	3.0+EDR						
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)						
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK						
Number of Channel:	79						
Hopping Channel Type:	Adaptive Frequency Hopping systems						
Sample Type:	Portable production						
Test power grade:	BT3.0: 3 (manufacturer declare)						
Test software of EUT:	SoFia RFTTestTool V1.1(manufacturer declare)						
Antenna Type:	PIFA antenna						
Antenna Gain:	0dBi						
Test Voltage:	AC 120V/60Hz						
Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
3	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4	2405MHz	24	2425MHz	44	2445MHz	64	2465MHz
5	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz

6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
7	2408MHz	27	2428MHz	47	2448MHz	67	2468MHz
8	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
9	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
10	2411MHz	30	2431MHz	50	2451MHz	70	2471MHz
11	2412MHz	31	2432MHz	51	2452MHz	71	2472MHz
12	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
13	2414MHz	33	2434MHz	53	2454MHz	73	2474MHz
14	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz
15	2416MHz	35	2436MHz	55	2456MHz	75	2476MHz
16	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
17	2418MHz	37	2438MHz	57	2458MHz	77	2478MHz
18	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

6.4 Description of Support Units

The EUT has been tested independently.

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

6.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1910

Centre Testing International Group Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories..

A2LA-Lab Cert. No. 3061.01

Centre Testing International Group Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 886427

Centre Testing International Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 886427.

IC-Registration No.: 7408A-2

The 3m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408A-2 .

IC-Registration No.: 7408B-1

The 10m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408B-1.

NEMKO-Aut. No.: ELA503

Centre Testing International Group Co., Ltd. has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

VCCI

The Radiation 3 &10 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-4096.

Main Ports Conducted Interference Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-4563.

Telecommunication Ports Conducted Disturbance Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-2146.

The Radiation 3 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-758

6.7 Deviation from Standards

None.

6.8 Abnormalities from Standard Conditions

None.

6.9 Other Information Requested by the Customer

None.

6.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9 x 10 ⁻⁸
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)

5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

7 Equipment List

RF test system					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-31-2017
Spectrum Analyzer	Keysight	N9010A	MY54510339	04-01-2016	03-31-2017
Signal Generator	Keysight	N5182B	MY53051549	04-01-2016	03-31-2017
DC Power	Keysight	E3642A	MY54436035	04-01-2016	03-31-2017
PC-1	Lenovo	R4960d	---	04-01-2016	03-31-2017
power meter & power sensor	R&S	OSP120	101374	04-01-2016	03-31-2017
RF control unit	JS Tonscend	JS0806-2	158060006	04-01-2016	03-31-2017
BT&WI-FI Automatic test software	JS Tonscend	JS1120-2	---	04-01-2016	03-31-2017

Conducted disturbance Test					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100009	06-16-2016	06-15-2017
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	04-26-2017
LISN	R&S	ENV216	100098	06-16-2016	06-15-2017
LISN	schwarzbeck	NNLK8121	8121-529	06-16-2016	06-15-2017
Voltage Probe	R&S	ESH2-Z3	--	07-09-2014	07-07-2017
Current Probe	R&S	EZ17	100106	06-16-2016	06-15-2017
ISN	TESEQ GmbH	ISN T800	30297	01-29-2015	01-27-2017

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-05-2016	06-05-2019
TRILOG Broadband Antenna	SCHWARZBECK	VULB9163	9163-484	05-23-2016	05-22-2017
Microwave Preamplifier	Agilent	8449B	3008A02425	02-04-2016	02-03-2017
Horn Antenna	ETS-LINDGREN	3117	00057407	07-20-2015	07-18-2018
Loop Antenna	ETS	6502	00071730	07-30-2015	07-28-2017
Spectrum Analyzer	R&S	FSP40	100416	06-16-2016	06-15-2017
Receiver	R&S	ESCI	100435	06-16-2016	06-15-2017
Multi device Controller	matur	NCD/070/10711 112	---	01-12-2016	01-11-2017
LISN	schwarzbeck	NNBM8125	81251547	06-16-2016	06-15-2017
LISN	schwarzbeck	NNBM8125	81251548	06-16-2016	06-15-2017
Signal Generator	Agilent	E4438C	MY45095744	04-01-2016	03-31-2017
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-31-2017
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	04-26-2017
Cable line	Fulai(7M)	SF106	5219/6A	01-12-2016	01-11-2017
Cable line	Fulai(6M)	SF106	5220/6A	01-12-2016	01-11-2017
Cable line	Fulai(3M)	SF106	5216/6A	01-12-2016	01-11-2017
Cable line	Fulai(3M)	SF106	5217/6A	01-12-2016	01-11-2017
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2016	01-11-2017
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA09 CL12-0395-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA08 CL12-0393-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA04 CL12-0396-002	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA03 CL12-0394-001	---	01-12-2016	01-11-2017

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15C (2015)	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Test Results List:

Test requirement	Test method	Test item	Verdict	Note
Part15C Section15.247 (a)(1)	ANSI 63.10	20dB Occupied Bandwidth	PASS	Appendix A)
Part15C Section15.247 (a)(1)	ANSI 63.10	Carrier Frequencies Separation	PASS	Appendix B)
Part15C Section 15.247 (a)(1)	ANSI 63.10	Dwell Time	PASS	Appendix C)
Part15C Section15.247 (b)	ANSI 63.10	Hopping Channel Number	PASS	Appendix D)
Part15C Section15.247 (b)(1)	ANSI 63.10	Conducted Peak Output Power	PASS	Appendix E)
Part15C Section15.247(d)	ANSI 63.10	Band-edge for RF Conducted Emissions	PASS	Appendix F)
Part15C Section15.247(d)	ANSI 63.10	RF Conducted Spurious Emissions	PASS	Appendix G)
Part15C Section 15.247 (a)(1)	ANSI 63.10	Pseudorandom Frequency Hopping Sequence	PASS	Appendix H)
Part15C Section 15.203/15.247 (c)	ANSI 63.10	Antenna Requirement	PASS	Appendix I)
Part15C Section15.207	ANSI 63.10	AC Power Line Conducted Emission	PASS	Appendix J)
Part15C Section 15.205/15.209	ANSI 63.10	Restricted bands around fundamental frequency (Radiated) Emission)	PASS	Appendix K)
Part15C Section 15.205/15.209	ANSI 63.10	Radiated Spurious Emissions	PASS	Appendix L)

Appendix A): 20dB Occupied Bandwidth

Test Result

Mode	Channel.	20dB Bandwidth [MHz]	99% OBW [MHz]	Verdict	Remark
GFSK	LCH	1.040	0.92091	PASS	Peak detector
GFSK	MCH	1.027	0.91267	PASS	
GFSK	HCH	1.024	0.91324	PASS	
$\pi/4$ DQPSK	LCH	1.287	1.1754	PASS	
$\pi/4$ DQPSK	MCH	1.286	1.1764	PASS	
$\pi/4$ DQPSK	HCH	1.287	1.1771	PASS	
8DPSK	LCH	1.285	1.1711	PASS	
8DPSK	MCH	1.286	1.1706	PASS	
8DPSK	HCH	1.275	1.1708	PASS	

Test Graph



<p>$\pi/4$DQPSK/LCH</p>	 <p>KeySight Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.40200000 GHz</p> <p>Ref Offset 19.08 dB Ref 19.08 dBm</p> <p>Center 2.402 GHz #Res BW 30 kHz</p> <p>Occupied Bandwidth 1.1754 MHz</p> <p>Total Power 8.87 dBm</p> <p>Transmit Freq Error -26.897 kHz</p> <p>x dB Bandwidth 1.287 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -20.00 dB</p>
<p>$\pi/4$DQPSK/MCH</p>	 <p>KeySight Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.441000000 GHz</p> <p>Ref Offset 19.02 dB Ref 19.02 dBm</p> <p>Center 2.441 GHz #Res BW 30 kHz</p> <p>Occupied Bandwidth 1.1764 MHz</p> <p>Total Power 8.89 dBm</p> <p>Transmit Freq Error -26.969 kHz</p> <p>x dB Bandwidth 1.286 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -20.00 dB</p>
<p>$\pi/4$DQPSK/HCH</p>	 <p>KeySight Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.480000000 GHz</p> <p>Ref Offset 19.05 dB Ref 19.05 dBm</p> <p>Center 2.48 GHz #Res BW 30 kHz</p> <p>Occupied Bandwidth 1.1771 MHz</p> <p>Total Power 9.03 dBm</p> <p>Transmit Freq Error -29.440 kHz</p> <p>x dB Bandwidth 1.287 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -20.00 dB</p>

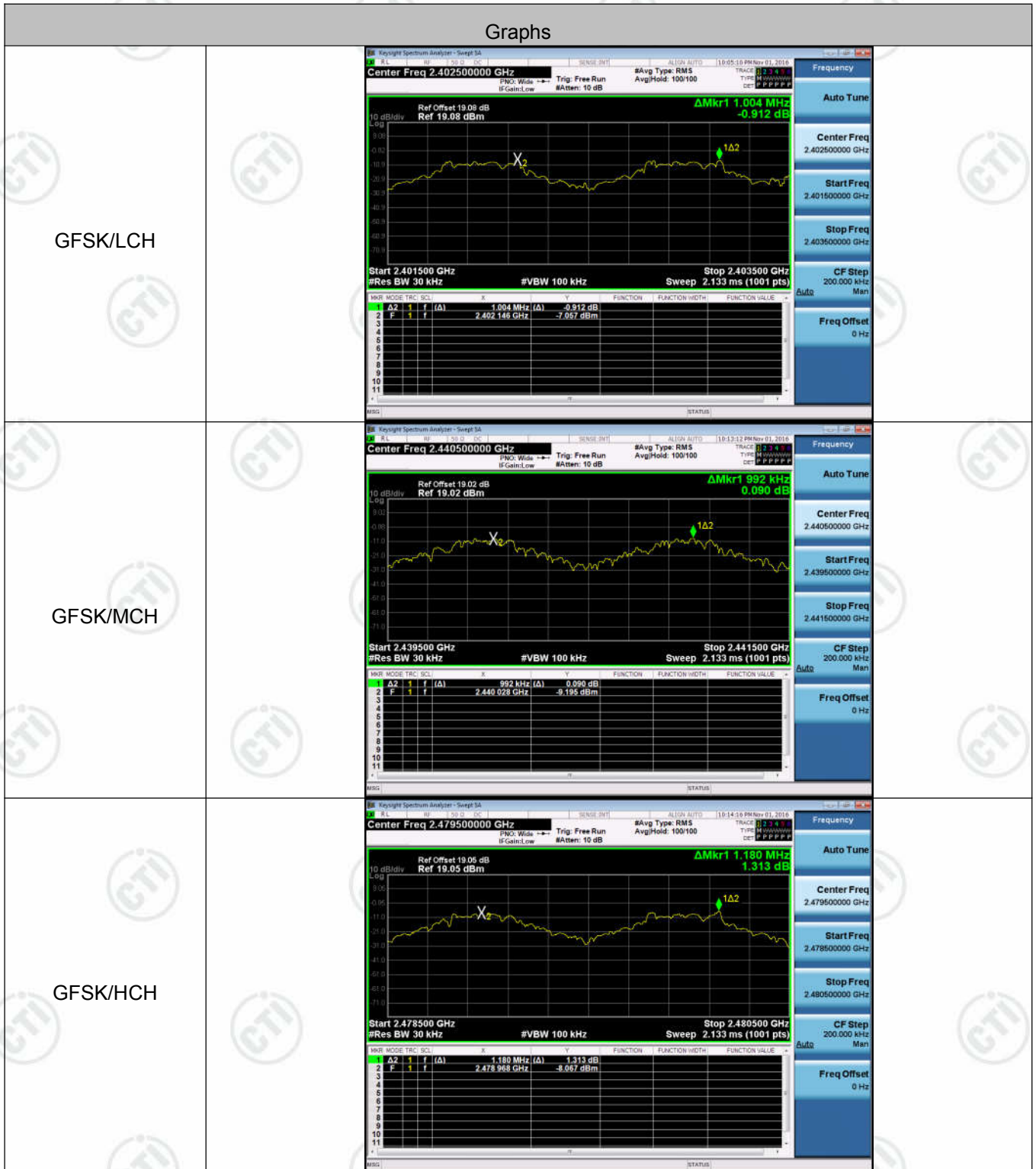
<p>8DPSK/LCH</p>	 <p>Keyight Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.40200000 GHz</p> <p>Ref Offset 19.08 dB Ref 19.08 dBm</p> <p>Center 2.402 GHz #Res BW 30 kHz</p> <p>Occupied Bandwidth 1.1711 MHz</p> <p>Total Power 8.65 dBm</p> <p>Transmit Freq Error -25.330 kHz</p> <p>x dB Bandwidth 1.285 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -20.00 dB</p>
<p>8DPSK/MCH</p>	 <p>Keyight Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.44100000 GHz</p> <p>Ref Offset 19.02 dB Ref 19.02 dBm</p> <p>Center 2.441 GHz #Res BW 30 kHz</p> <p>Occupied Bandwidth 1.1706 MHz</p> <p>Total Power 8.84 dBm</p> <p>Transmit Freq Error -25.635 kHz</p> <p>x dB Bandwidth 1.286 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -20.00 dB</p>
<p>8DPSK/HCH</p>	 <p>Keyight Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.48000000 GHz</p> <p>Ref Offset 19.05 dB Ref 19.05 dBm</p> <p>Center 2.48 GHz #Res BW 30 kHz</p> <p>Occupied Bandwidth 1.1708 MHz</p> <p>Total Power 9.07 dBm</p> <p>Transmit Freq Error -27.387 kHz</p> <p>x dB Bandwidth 1.275 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -20.00 dB</p>

Appendix B): Carrier Frequency Separation

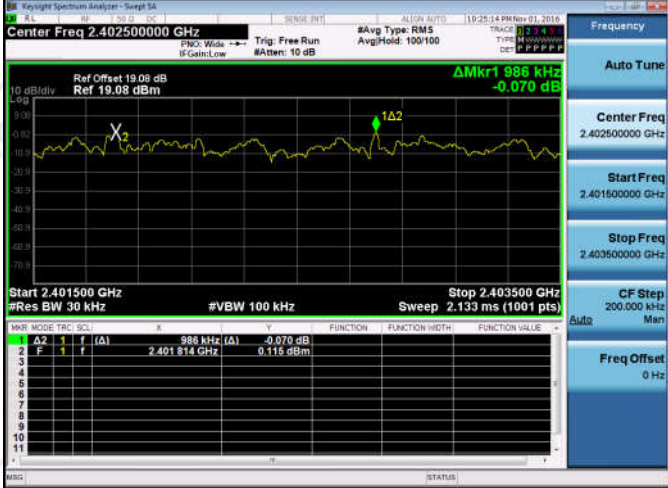
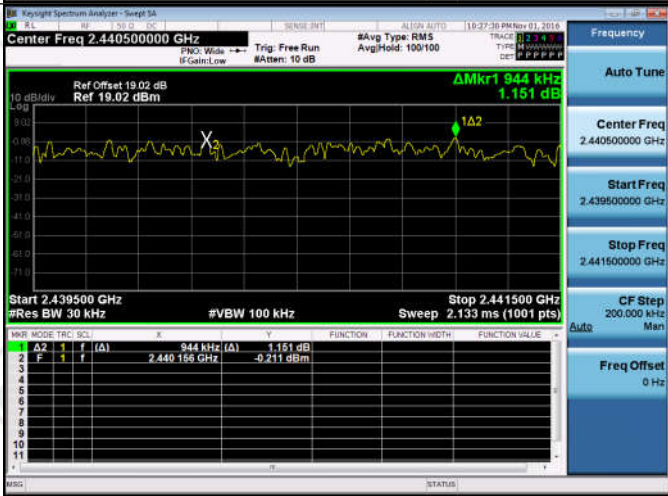
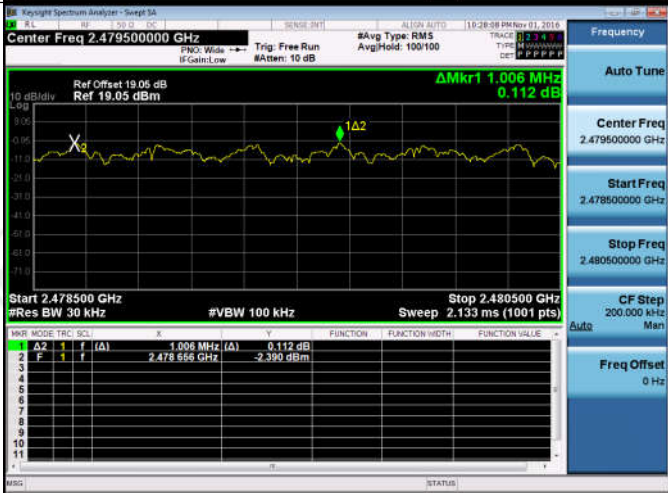
Result Table

Mode	Channel.	Carrier Frequency Separation [MHz]	Verdict
GFSK	LCH	1.004	PASS
GFSK	MCH	0.992	PASS
GFSK	HCH	1.180	PASS
$\pi/4$ DQPSK	LCH	0.996	PASS
$\pi/4$ DQPSK	MCH	1.124	PASS
$\pi/4$ DQPSK	HCH	0.982	PASS
8DPSK	LCH	0.986	PASS
8DPSK	MCH	0.944	PASS
8DPSK	HCH	1.006	PASS

Test Graph



<p>$\pi/4$DQPSK/LCH</p>	<p>Keyight Spectrum Analyzer - Sweep SA Center Freq 2.402500000 GHz Ref Offset 19.08 dB Ref 19.08 dBm Delta Freq 996 kHz (-0.424 dB) Delta Freq 2.401798 GHz (-0.169 dBm) Start 2.401500 GHz #Res BW 30 kHz #VBW 100 kHz Stop 2.403500 GHz Sweep 2.133 ms (1001 pts)</p> <table border="1"> <thead> <tr> <th>MNR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION METH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Δf</td> <td>f</td> <td>(Δ)</td> <td>996 kHz (Δ)</td> <td>-0.424 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td>f</td> <td>2.401798 GHz</td> <td>-0.169 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION METH	FUNCTION VALUE	1	Δf	f	(Δ)	996 kHz (Δ)	-0.424 dB				2	F	f	f	2.401798 GHz	-0.169 dBm			
MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION METH	FUNCTION VALUE																				
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<p>$\pi/4$DQPSK/MCH</p>	<p>Keyight Spectrum Analyzer - Sweep SA Center Freq 2.440500000 GHz Ref Offset 19.02 dB Ref 19.02 dBm Delta Freq 1.124 MHz (-0.617 dB) Delta Freq 2.439324 GHz (-0.878 dBm) Start 2.439500 GHz #Res BW 30 kHz #VBW 100 kHz Stop 2.441500 GHz Sweep 2.133 ms (1001 pts)</p> <table border="1"> <thead> <tr> <th>MNR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION METH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Δf</td> <td>f</td> <td>(Δ)</td> <td>1.124 MHz (Δ)</td> <td>-0.617 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td>f</td> <td>2.439324 GHz</td> <td>-0.878 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION METH	FUNCTION VALUE	1	Δf	f	(Δ)	1.124 MHz (Δ)	-0.617 dB				2	F	f	f	2.439324 GHz	-0.878 dBm			
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2	F	f	f	2.439324 GHz	-0.878 dBm																							
<p>$\pi/4$DQPSK/HCH</p>	<p>Keyight Spectrum Analyzer - Sweep SA Center Freq 2.479500000 GHz Ref Offset 19.05 dB Ref 19.05 dBm Delta Freq 982 kHz (-1.641 dB) Delta Freq 2.478514 GHz (-1.659 dBm) Start 2.478500 GHz #Res BW 30 kHz #VBW 100 kHz Stop 2.480500 GHz Sweep 2.133 ms (1001 pts)</p> <table border="1"> <thead> <tr> <th>MNR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION METH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Δf</td> <td>f</td> <td>(Δ)</td> <td>982 kHz (Δ)</td> <td>-1.641 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td>f</td> <td>2.478514 GHz</td> <td>-1.659 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION METH	FUNCTION VALUE	1	Δf	f	(Δ)	982 kHz (Δ)	-1.641 dB				2	F	f	f	2.478514 GHz	-1.659 dBm			
MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION METH	FUNCTION VALUE																				
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<p>8DPSK/LCH</p>	
<p>8DPSK/MCH</p>	
<p>8DPSK/HCH</p>	

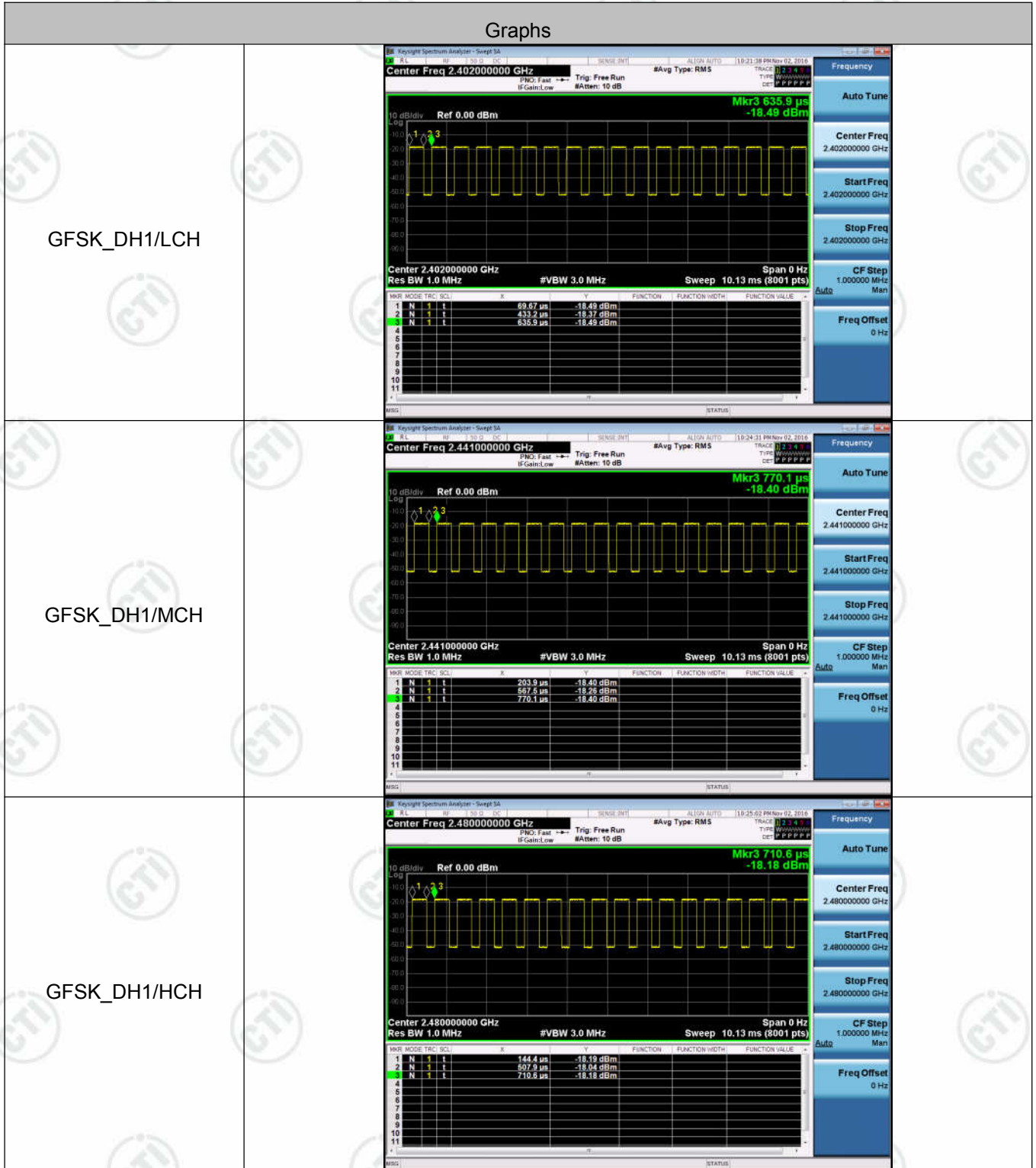
Appendix C): Dwell Time

Result Table

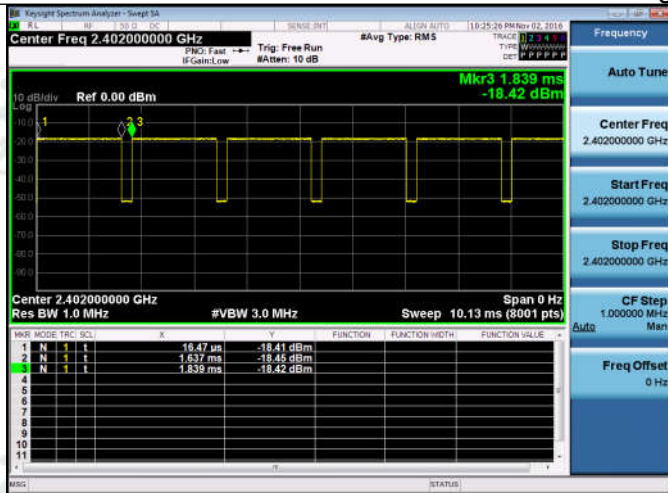
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Duty Cycle [%]	Verdict
GFSK	DH1	LCH	0.3635333	320	0.116	0.64	PASS
GFSK	DH1	MCH	0.363534	320	0.116	0.64	PASS
GFSK	DH1	HCH	0.363533	320	0.116	0.64	PASS
GFSK	DH3	LCH	1.6200633	160	0.259	0.89	PASS
GFSK	DH3	MCH	1.62007	160	0.259	0.89	PASS
GFSK	DH3	HCH	1.62007	160	0.259	0.89	PASS
GFSK	DH5	LCH	2.86773	106.7	0.306	0.93	PASS
GFSK	DH5	MCH	2.86773	106.7	0.306	0.93	PASS
GFSK	DH5	HCH	2.86773	106.7	0.306	0.93	PASS

Remark : All modes are tested, only the worst mode GFSK is reported.

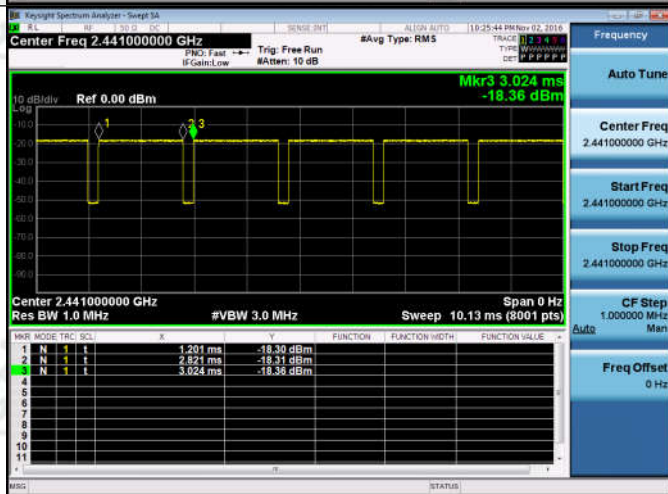
Test Graph



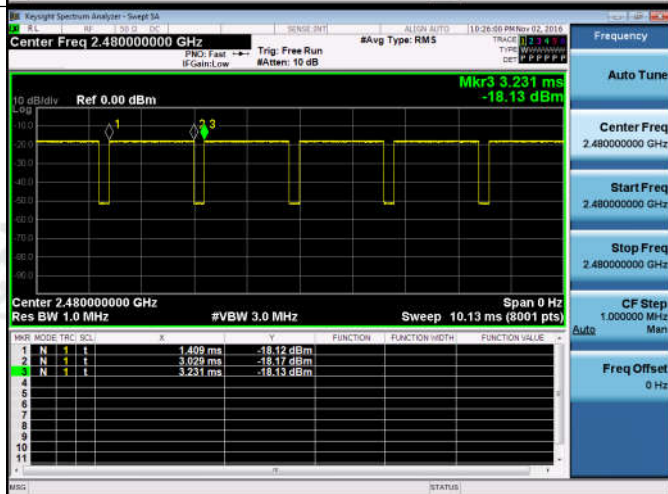
GFSK_DH3/LCH



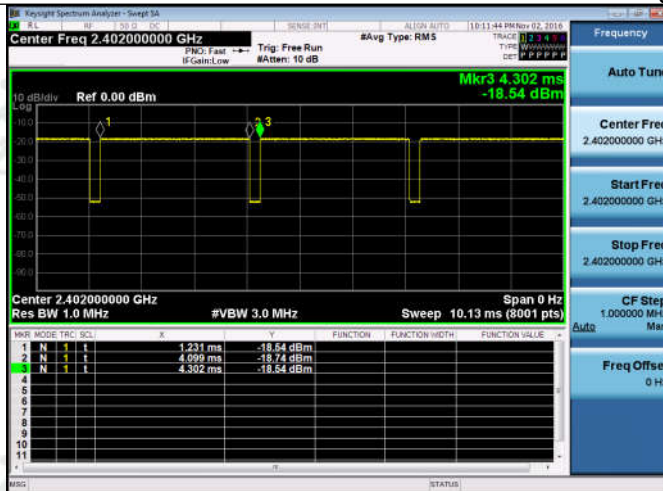
GFSK_DH3/MCH



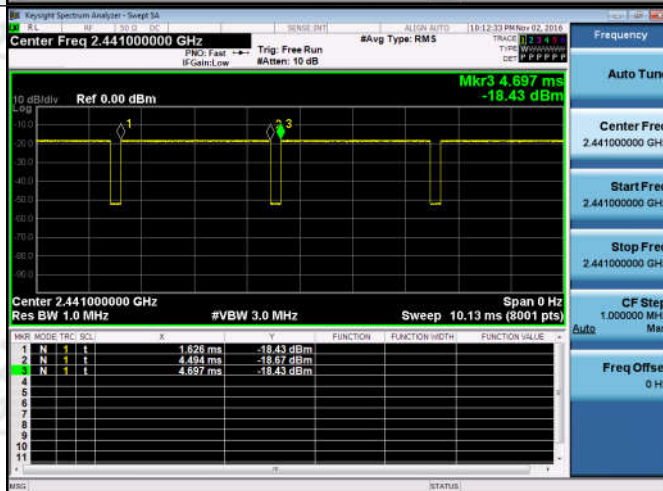
GFSK_DH3/HCH



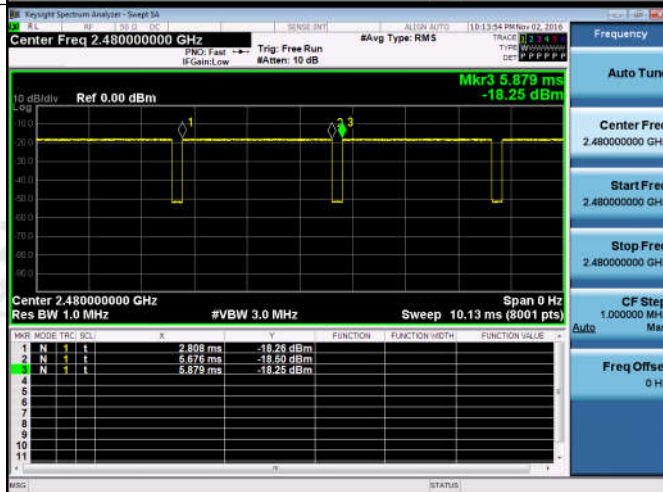
GFSK_DH5/LCH



GFSK_DH5/MCH



GFSK_DH5/HCH

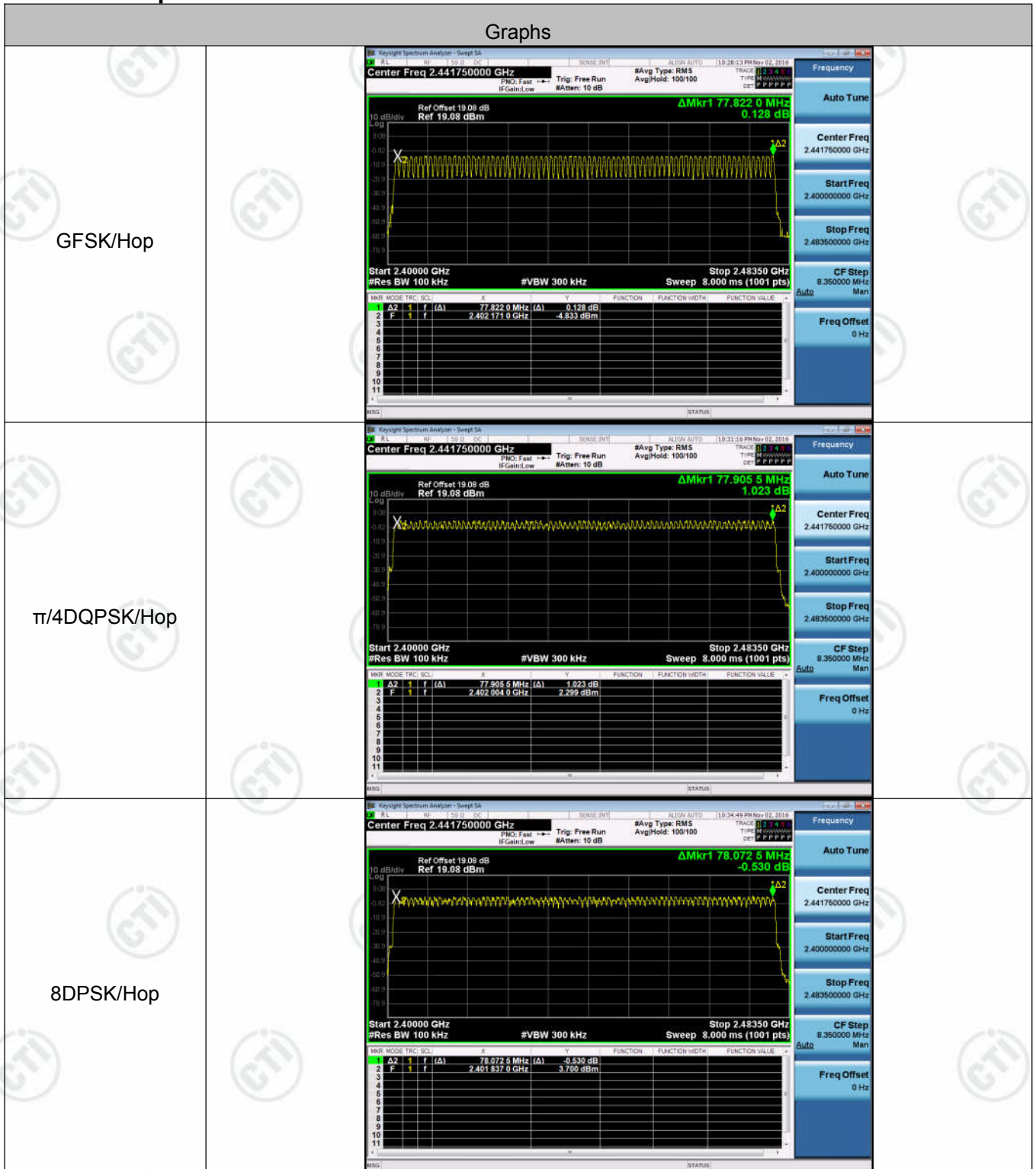


Appendix D): Hopping Channel Number

Result Table

Mode	Channel.	Number of Hopping Channel	Verdict
GFSK	Hop	79	PASS
$\pi/4$ DQPSK	Hop	79	PASS
8DPSK	Hop	79	PASS

Test Graph



Appendix E): Conducted Peak Output Power

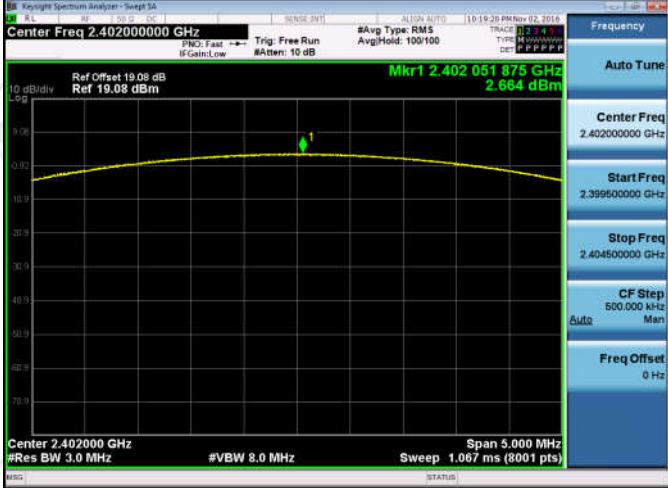
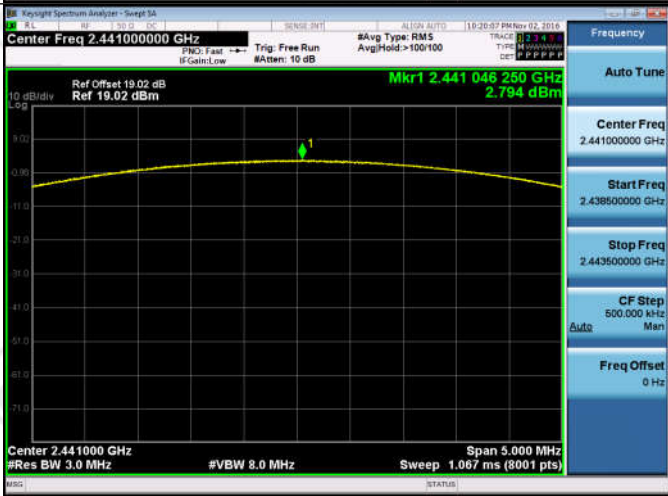
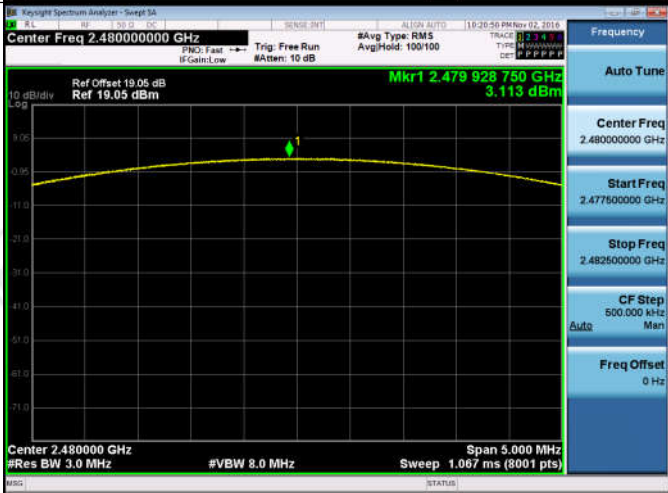
Result Table

Mode	Channel.	Maximum Peak Output Power [dBm]	Verdict
GFSK	LCH	0.976	PASS
GFSK	MCH	1.023	PASS
GFSK	HCH	1.200	PASS
$\pi/4$ DQPSK	LCH	2.384	PASS
$\pi/4$ DQPSK	MCH	2.426	PASS
$\pi/4$ DQPSK	HCH	2.683	PASS
8DPSK	LCH	2.664	PASS
8DPSK	MCH	2.794	PASS
8DPSK	HCH	3.113	PASS

Test Graph

Graphs	
GFSK/LCH	<p>KeySight Spectrum Analyzer - Sweep SA Center Freq 2.40200000 GHz Ref Offset 19.08 dB Ref 19.08 dBm Mkr1 2.401879375 GHz 0.976 dBm #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts)</p>
GFSK/MCH	<p>KeySight Spectrum Analyzer - Sweep SA Center Freq 2.44100000 GHz Ref Offset 19.02 dB Ref 19.02 dBm Mkr1 2.440944375 GHz 1.023 dBm #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts)</p>
GFSK/HCH	<p>KeySight Spectrum Analyzer - Sweep SA Center Freq 2.48000000 GHz Ref Offset 19.05 dB Ref 19.05 dBm Mkr1 2.479868750 GHz 1.200 dBm #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts)</p>

<p>$\pi/4$DQPSK/LCH</p>	
<p>$\pi/4$DQPSK/MCH</p>	
<p>$\pi/4$DQPSK/HCH</p>	

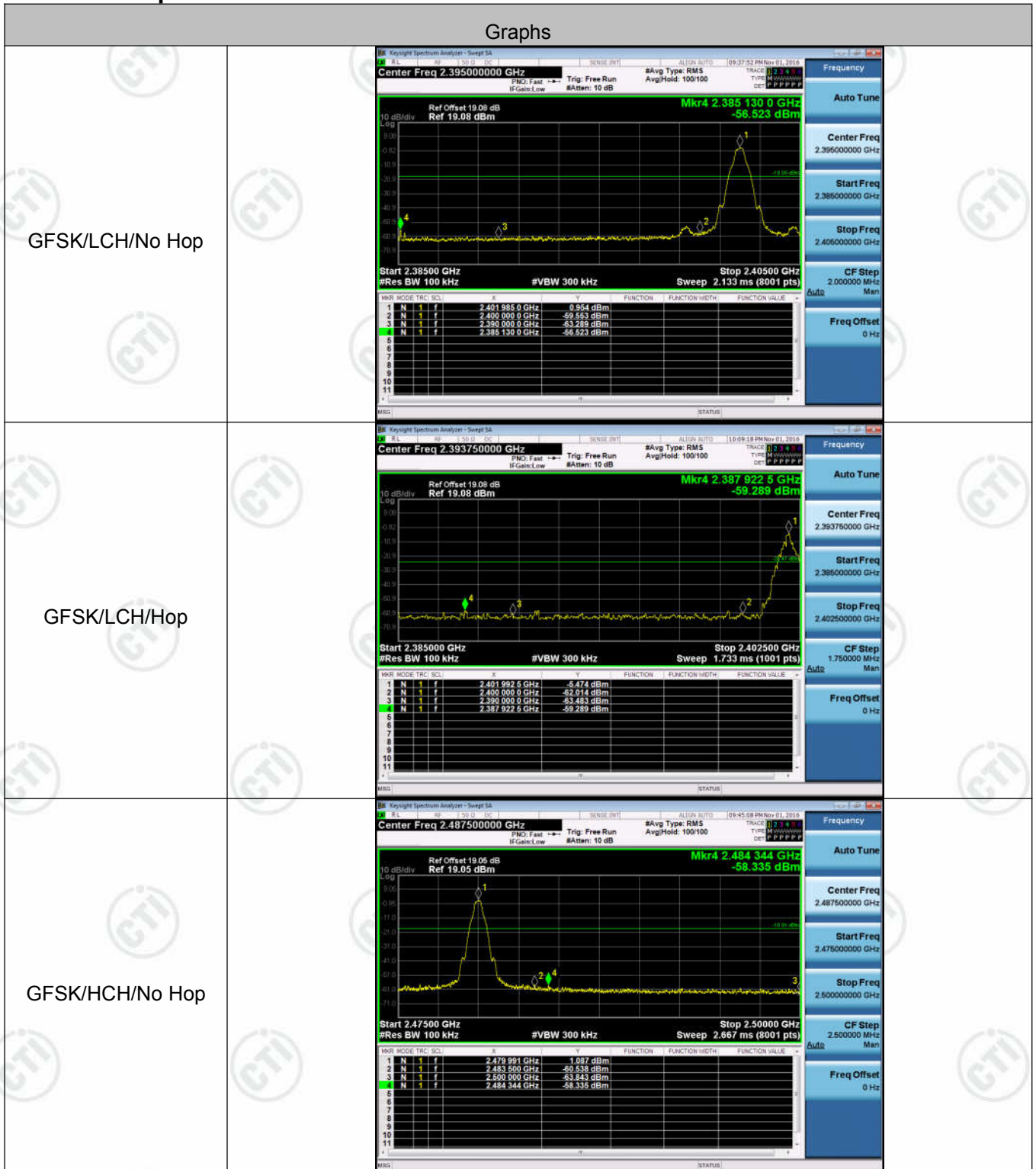
<p>8DPSK/LCH</p>	
<p>8DPSK/MCH</p>	
<p>8DPSK/HCH</p>	

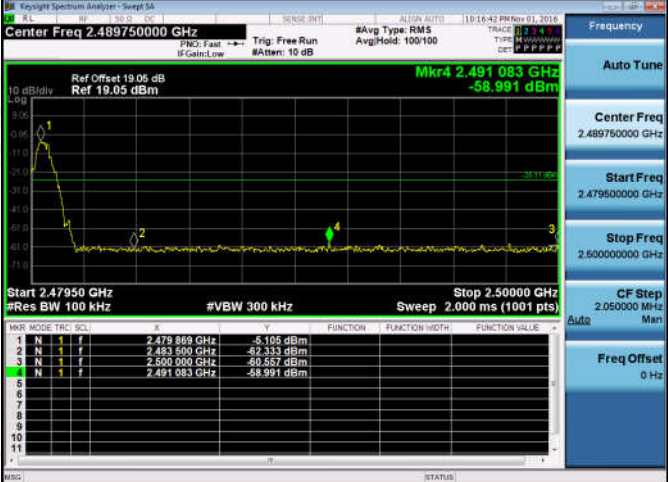
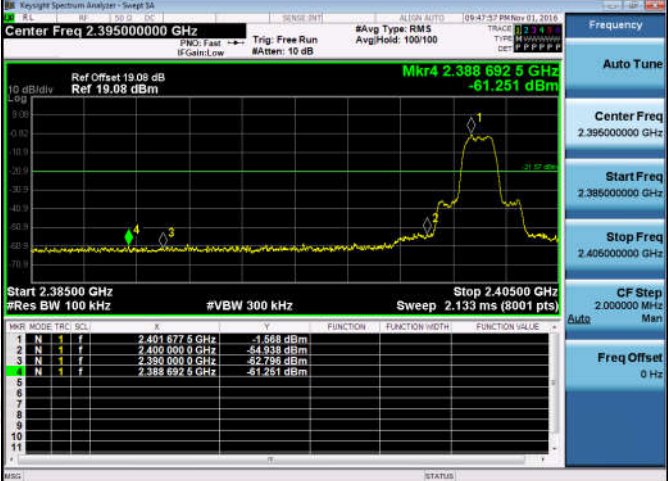
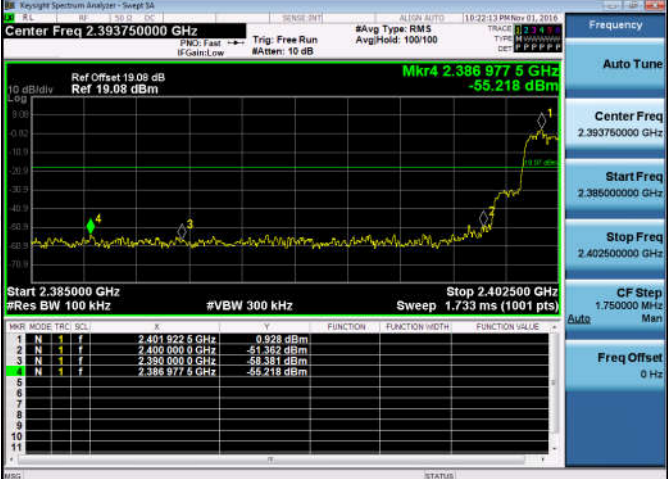
Appendix F): Band-edge for RF Conducted Emissions

Result Table

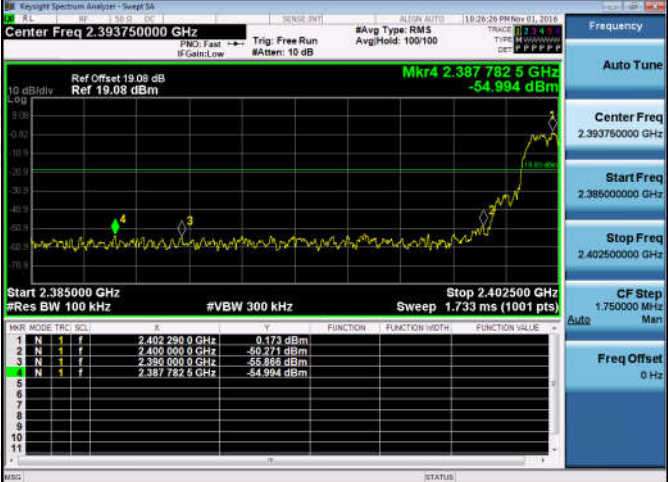
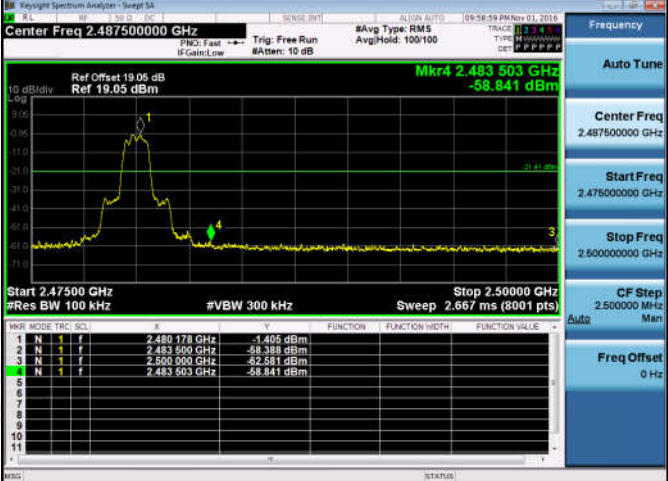
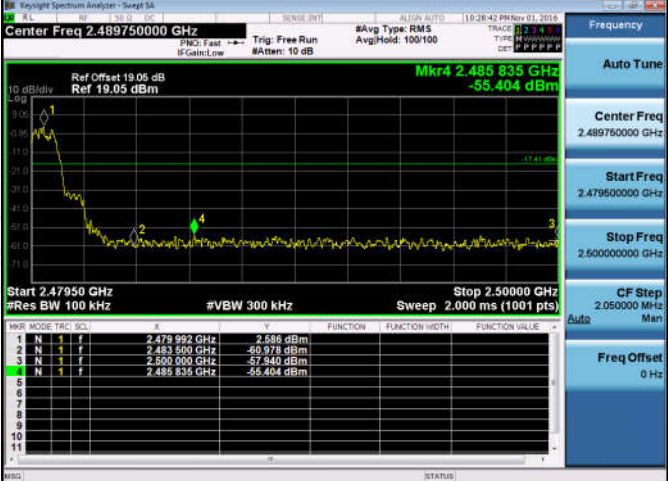
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.954	Off	-56.523	-19.05	PASS
			-5.474	On	-59.289	-25.47	PASS
GFSK	HCH	2480	1.087	Off	-58.335	-18.91	PASS
			-5.105	On	-58.991	-25.11	PASS
$\pi/4$ DQPSK	LCH	2402	-1.568	Off	-61.251	-21.57	PASS
			0.928	On	-55.218	-19.07	PASS
$\pi/4$ DQPSK	HCH	2480	-1.373	Off	-58.488	-21.37	PASS
			0.209	On	-54.223	-19.79	PASS
8DPSK	LCH	2402	-1.653	Off	-59.334	-21.65	PASS
			0.173	On	-54.994	-19.83	PASS
8DPSK	HCH	2480	-1.405	Off	-58.841	-21.41	PASS
			2.586	On	-55.404	-17.41	PASS

Test Graph



<p>GFSK/HCH/Hop</p>	
<p>$\pi/4$DQPSK/LCH/No Hop</p>	
<p>$\pi/4$DQPSK/LCH/Hop</p>	

<p>$\pi/4$DQPSK/HCH/No Hop</p>	<p>Keyight Spectrum Analyzer - Sweep 3A</p> <p>Center Freq 2.487500000 GHz</p> <p>Ref Offset 19.06 dB Ref 19.05 dBm</p> <p>Mkr4 2.483 691 GHz -58.488 dBm</p> <p>Start 2.47500 GHz Stop 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.667 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MNR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>2.479 675 GHz</td> <td>-1.373 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>2.483 500 GHz</td> <td>-59.807 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>N</td> <td>1</td> <td>f</td> <td>2.490 908 GHz</td> <td>-52.337 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>N</td> <td>1</td> <td>f</td> <td>2.483 691 GHz</td> <td>-58.488 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.479 675 GHz	-1.373 dBm				2	N	1	f	2.483 500 GHz	-59.807 dBm				3	N	1	f	2.490 908 GHz	-52.337 dBm				4	N	1	f	2.483 691 GHz	-58.488 dBm			
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<p>$\pi/4$DQPSK/HCH/Hop</p>	<p>Keyight Spectrum Analyzer - Sweep 3A</p> <p>Center Freq 2.489750000 GHz</p> <p>Ref Offset 19.05 dB Ref 19.05 dBm</p> <p>Mkr4 2.483 908 GHz -54.223 dBm</p> <p>Start 2.47950 GHz Stop 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.600 ms (1001 pts)</p> <table border="1"> <thead> <tr> <th>MNR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>2.480 954 GHz</td> <td>0.209 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>2.483 500 GHz</td> <td>-59.606 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>N</td> <td>1</td> <td>f</td> <td>2.490 908 GHz</td> <td>-52.223 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>N</td> <td>1</td> <td>f</td> <td>2.483 908 GHz</td> <td>-54.223 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.480 954 GHz	0.209 dBm				2	N	1	f	2.483 500 GHz	-59.606 dBm				3	N	1	f	2.490 908 GHz	-52.223 dBm				4	N	1	f	2.483 908 GHz	-54.223 dBm			
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4	N	1	f	2.483 908 GHz	-54.223 dBm																																									
<p>8DPSK/LCH/No Hop</p>	<p>Keyight Spectrum Analyzer - Sweep 3A</p> <p>Center Freq 2.395000000 GHz</p> <p>Ref Offset 19.08 dB Ref 19.08 dBm</p> <p>Mkr4 2.387 195 0 GHz -59.334 dBm</p> <p>Start 2.38500 GHz Stop 2.40500 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.133 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MNR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>2.402 177 5 GHz</td> <td>-1.853 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>2.400 000 0 GHz</td> <td>-55.807 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>N</td> <td>1</td> <td>f</td> <td>2.390 000 0 GHz</td> <td>-64.188 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>N</td> <td>1</td> <td>f</td> <td>2.387 195 0 GHz</td> <td>-59.334 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.402 177 5 GHz	-1.853 dBm				2	N	1	f	2.400 000 0 GHz	-55.807 dBm				3	N	1	f	2.390 000 0 GHz	-64.188 dBm				4	N	1	f	2.387 195 0 GHz	-59.334 dBm			
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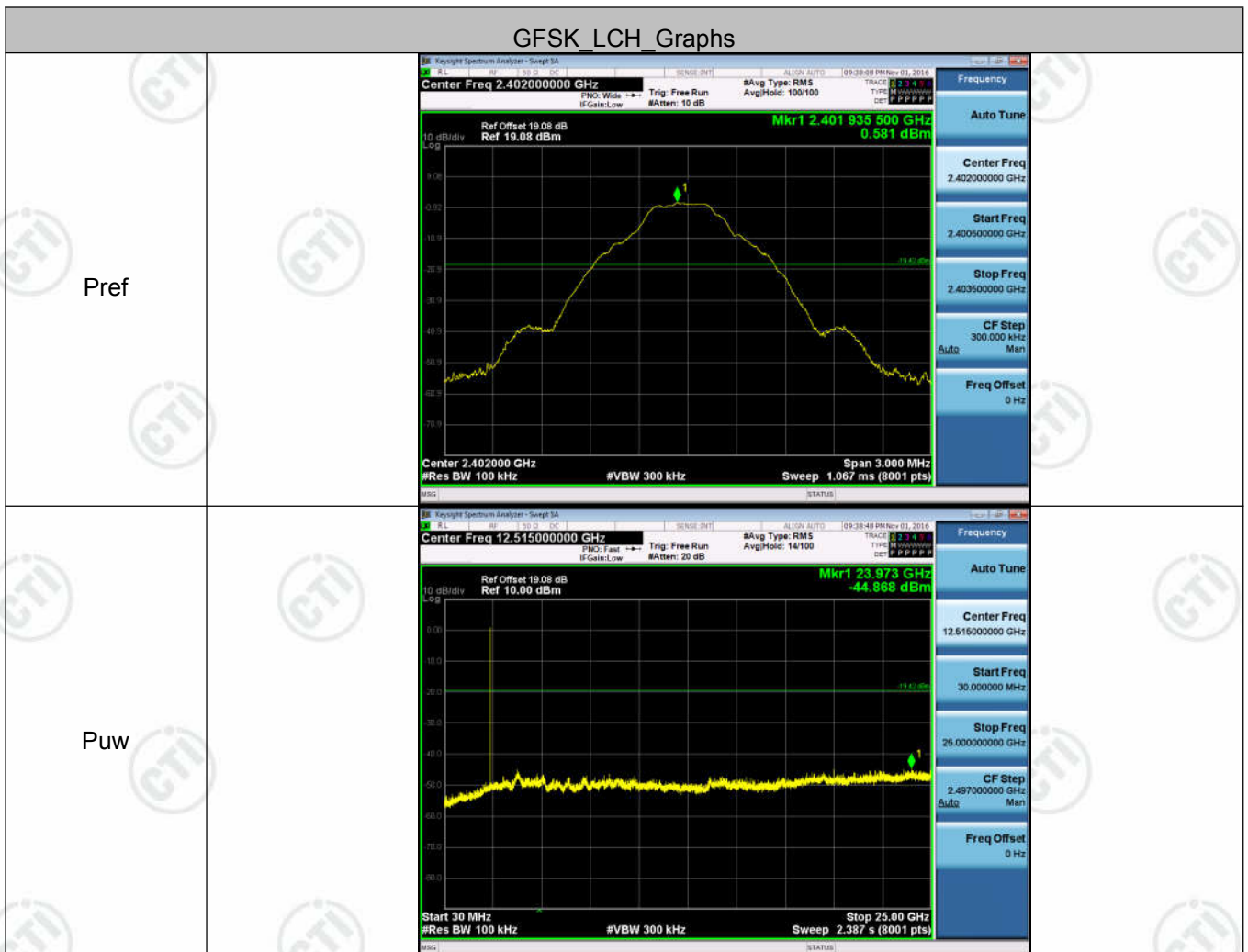
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<p>8DPSK/HCH/No Hop</p>	
<p>8DPSK/HCH/Hop</p>	

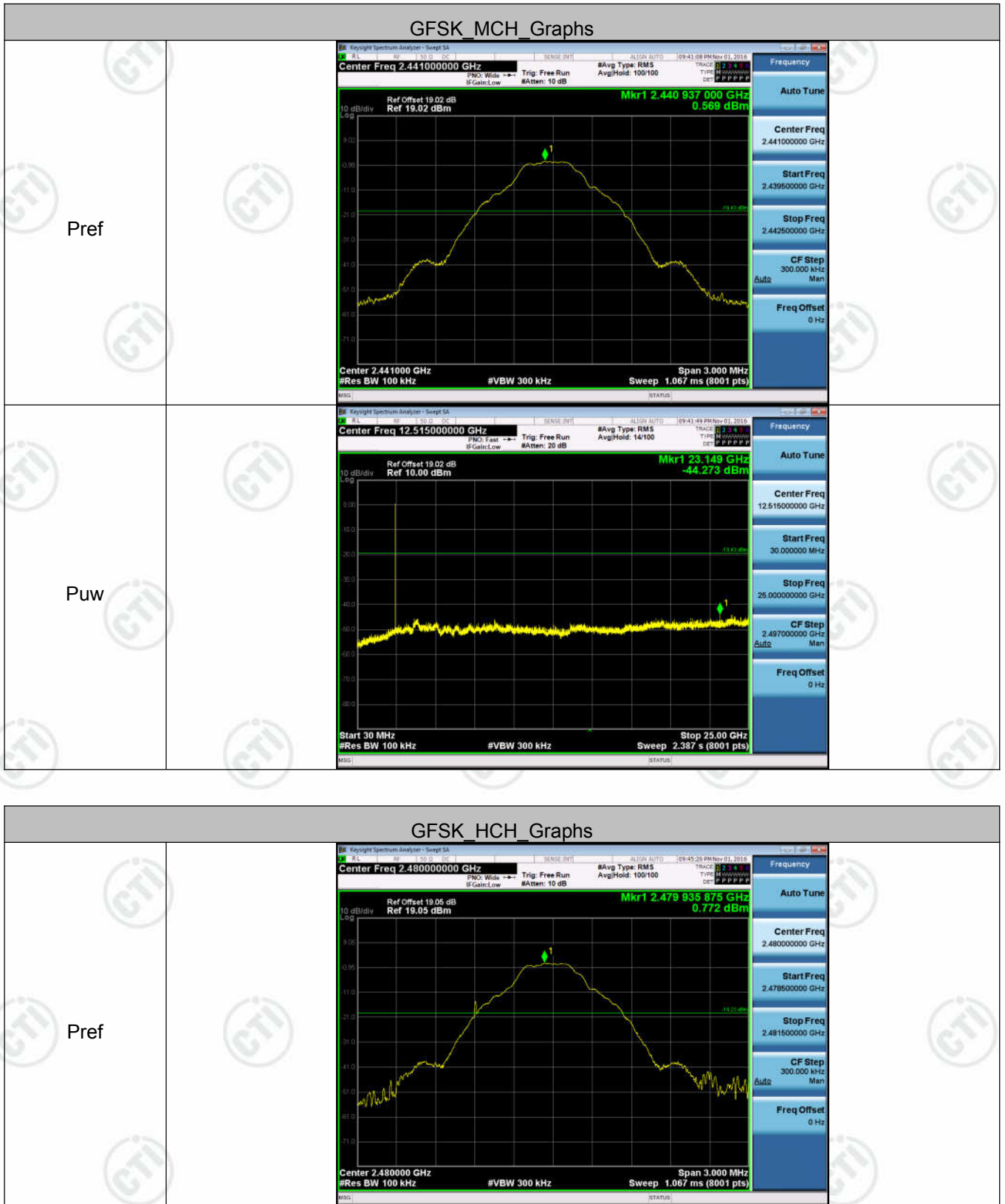
Appendix G): RF Conducted Spurious Emissions

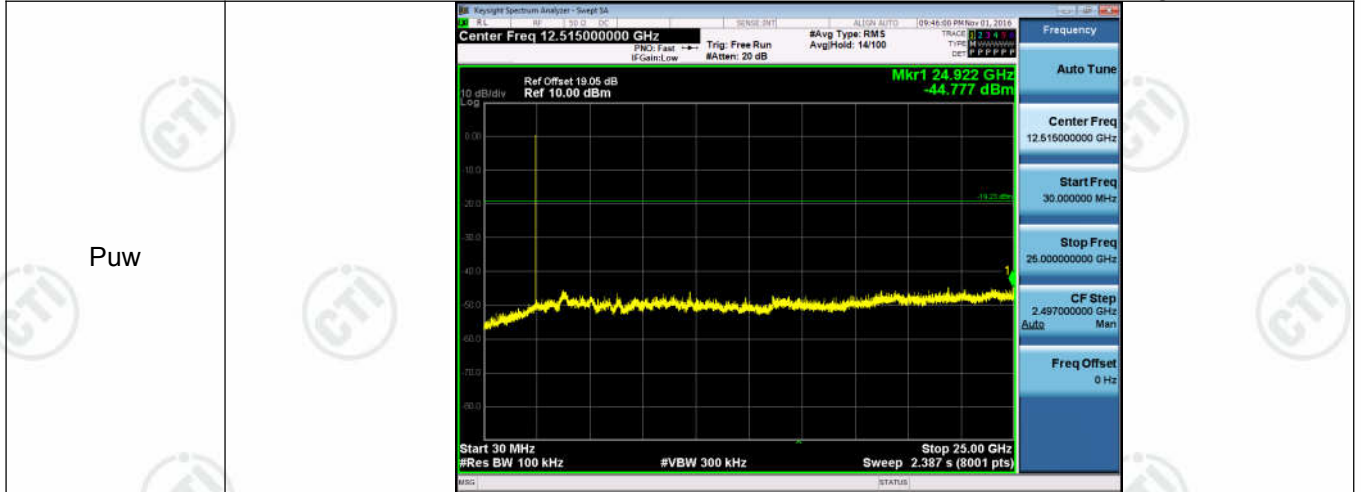
Result Table

Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
GFSK	LCH	0.581	<Limit	PASS
GFSK	MCH	0.569	<Limit	PASS
GFSK	HCH	0.772	<Limit	PASS
$\pi/4$ DQPSK	LCH	-1.801	<Limit	PASS
$\pi/4$ DQPSK	MCH	-1.761	<Limit	PASS
$\pi/4$ DQPSK	HCH	-1.58	<Limit	PASS
8DPSK	LCH	-1.961	<Limit	PASS
8DPSK	MCH	-1.888	<Limit	PASS
8DPSK	HCH	-1.724	<Limit	PASS

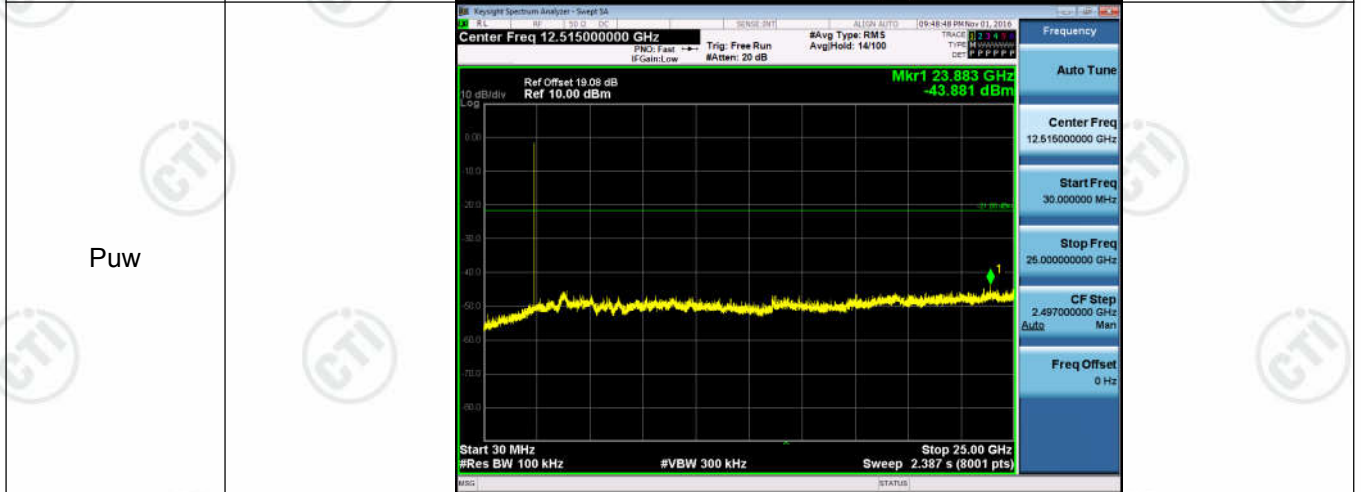
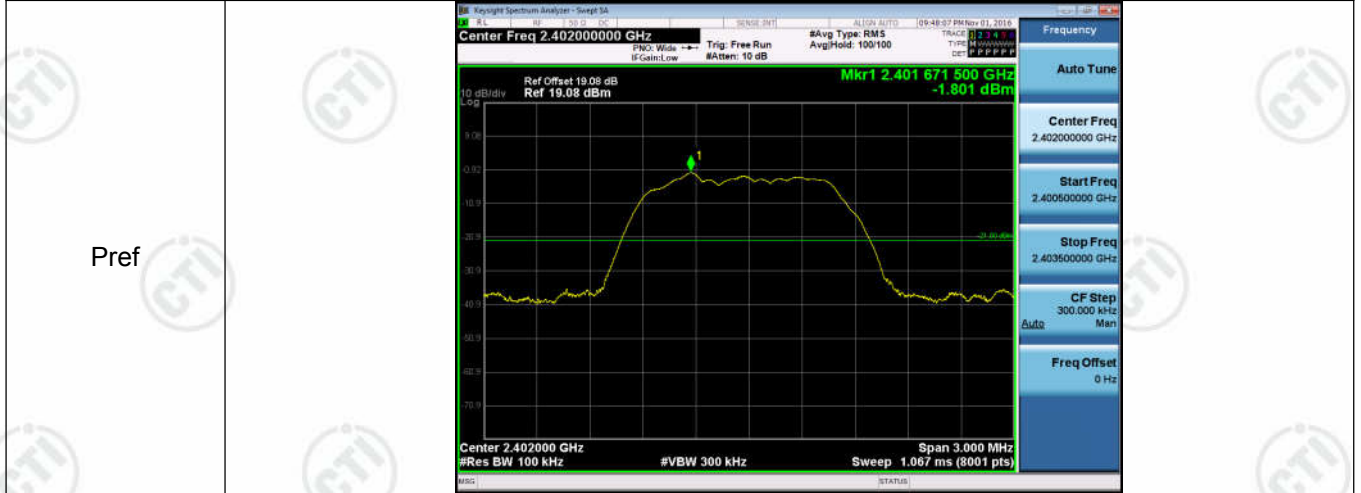
Test Graph

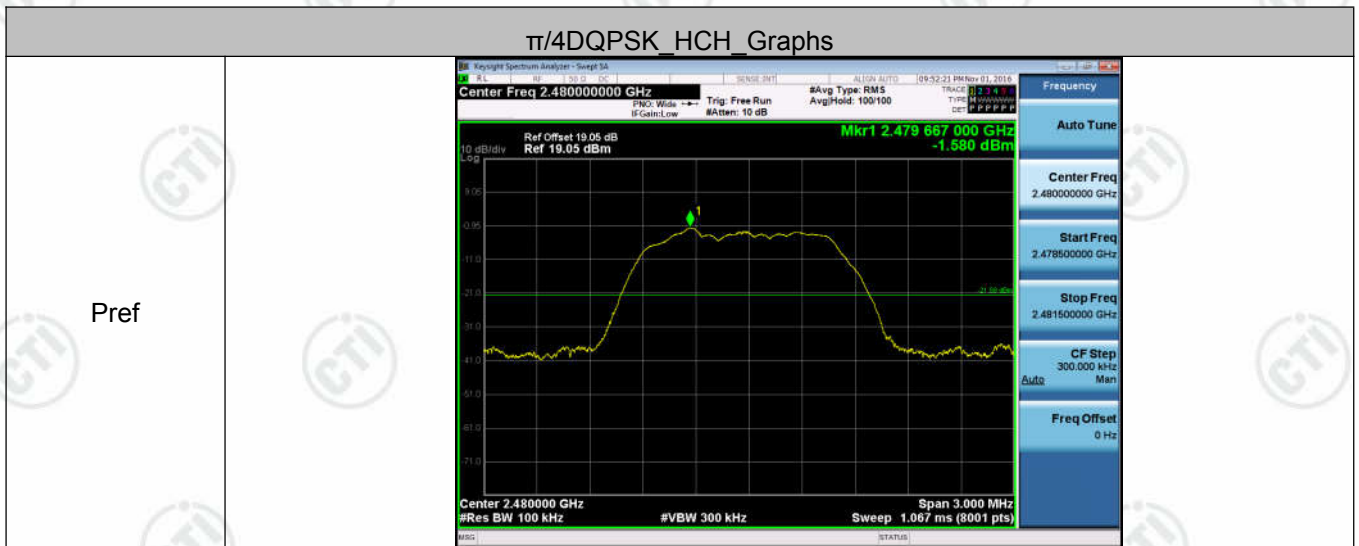
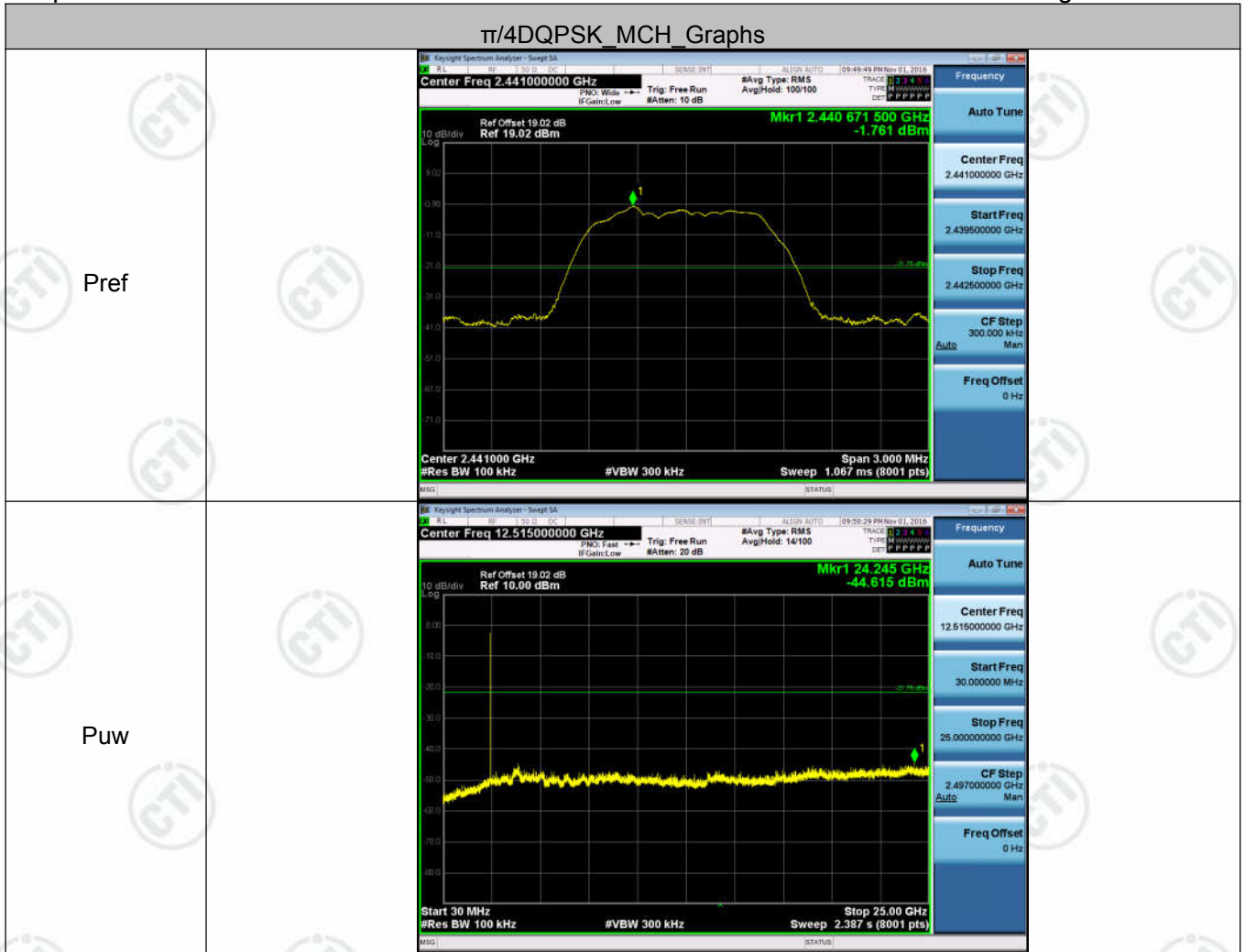


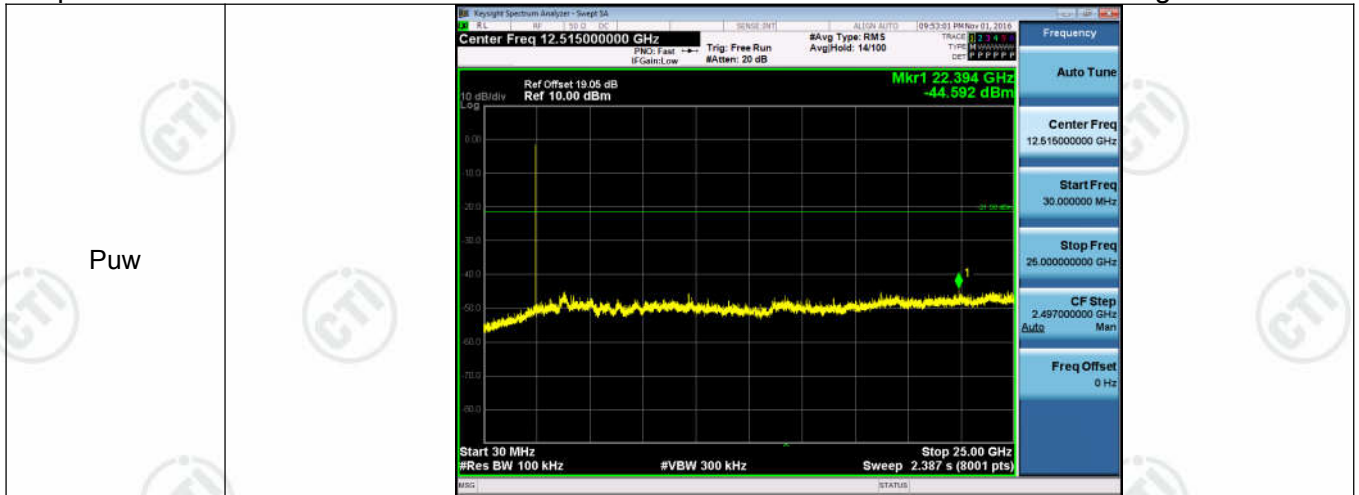




$\pi/4$ DQPSK_LCH_Graphs







8DPSK_LCH_Graphs

